

(54) MULTI-STAGE ROTARY BODY HEAT GENERATING DEVICE

(11) 60-23758 (A) (43) 6.2.1985 (19) JP

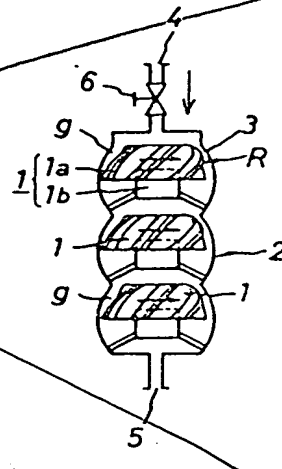
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PURPOSE: To obtain the highly efficient multi-stage rotary heat generating device prominent in sucking and discharging effect as well as heat generating effect by a method wherein more than two sets of rotary bodies are arranged in a tubular casing and friction heat generating sections are formed in the rotating areas of respective rotary bodies through minute clearances to generate heat in stepwise in gas sucked thereinto.

CONSTITUTION: The rotary body 1, consisting of three sets of electric motors 1b and rotary vanes 1a, is provided vertically in the tubular casing 2 of three stage structure while respective rotary bodies 1 and the tubular casings 2 form the friction heat generating sections 3 having the clearances (g) in the rotary area R of the rotary vanes 1a. When respective rotary bodies 1 are rotated into the arrow sign directions by the motor 1b, the gas discharging outputs of respective rotary bodies 1 and the amount of suction of atmospheric air keep a subatmospheric equilibrium in the flowing condition of the gas and the heat generating effect thereof increases gradually from the first stage whereby heated air may be discharged out of a gas discharging port 5.

**(54) HEAT EXCHANGER**

(11) 60-23783 (A) (43) 6.2.1985 (19) JP

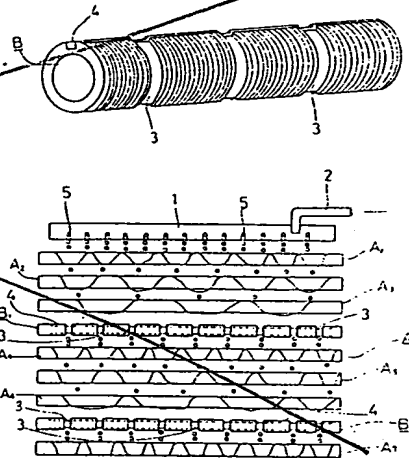
(21) Appl. No. 58-131556 (22) 18.7.1983

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(51) Int. Cl. F28D3/00

PURPOSE: To secure substantially uniform drenched surfaces in the whole of the group of heat transfer tubes by a method wherein liquid dispersing members, having a multitude of outer peripheral grooves and an upper surface groove, are interposed at every predetermined stages of the heat transfer tube.

CONSTITUTION: Liquid, introduced into a liquid distributor 1 through a pipe 2, is dispersed substantially uniformly on the heat transfer tube A₁ through a plurality of pores 5, 5... and flows down along the outer surface of the tube under forming liquid film, then, is dripped from the bottom of the tube A₁ onto the heat transfer tube A₂. The liquid, flowing down along the outer surface of the heat transfer tube, shows the tendency of coherence due to the affection of viscosity or surface tension, therefore, the number of dripping places of the liquid at the bottom of a lower stage heat transfer tube is smaller than the same of the upper stage heat transfer tube and the deviation of the dripping of liquid is generated. The liquid, dripped from the tube A₁ onto the liquid dispersing member B₁, under being deviated, flows to right and left along the upper surface groove 4 of the member B₁, subsequently, it flows down along a multitude of outer peripheral grooves 3, 3... and drips substantially uniformly onto the heat transfer tube A₂. The deviation of the drip of liquid at the bottom of the heat transfer tube A₂ may be corrected by the liquid dispersing member B₂ in the same manner.

**(54) SEPARATE TYPE HEAT PIPE**

(11) 60-23784 (A) (43) 6.2.1985 (19) JP

(21) Appl. No. 58-130305 (22) 19.7.1983

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(51) Int. Cl. F28D15/02, F28D21/00

PURPOSE: To prevent to generate troubles in the operation of the heat pipe by a method wherein a bypassing side path is provided between a steam communicating pipe and a condensed liquid communicating pipe to flow drain generated in the steam communicating pipe to the side of condensed liquid communicating pipe.

CONSTITUTION: A drain communicating pipe 9 is provided between the steam communicating pipe 7 and the condensed liquid communicating pipe 8 to flow the drain, generated in the steam communicating pipe 7, into the condensed liquid communicating pipe 8. A pressure reducing valve 10, a U-shape pipe 11 filled with operating liquid and a blow valve 12 are connected in series on the way of the drain communicating pipe 9, an overflow pipe 13 is connected to the other end of the U-shape pipe 11 and the drain in the steam, in which the steam and the liquid are mixed, is discharged by the pressure reducing valve 10 while the drain is bypassed by the overflow pipe 13 into the condensed liquid communicating pipe 8. The blow valve 12 is fully opened upon beginning the operation of a boiler or the like together with the pressure reducing valve 10 to discharge the rust or the like of the path of pipelines to the air. In another way, a drain trap 14 and the pressure reducing valve 10 are connected in series to the drain communicating pipe 9 and a valve 15 for maintenance is connected in parallel to these trap and valve.

